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Dear Michael

Thank you for the paper by Heywood & yourself, which does help to clarify the relation between locality and the algebraic structure of q.m. propositions. The discrimination between ontological contextuality & contextuality in the measurement situation) seems to me clear and useful. I was not able to study the details of your argument, but your conclusion on the ~~incompatibility~~ of VR and MLOC & OLOC seems correct to me. The one thing that troubles me is that your proof is so long. Would it not be possible to reach the conclusion in many fewer steps, in the following way? I shall use the notation of my paper with Hultgren, J. Math. Phys. 18, 381 (1977), which I think you have. If $\hat{n}_1, \hat{n}_2, \hat{n}_3$ are mutually orthogonal then $a_1(\hat{n}_1, 0)$, $a_1(\hat{n}_2, 0)$, $a_1(\hat{n}_3$ can be simultaneously measured. The subscript 1 on a indicates particle 1 of a pair, and we assume that the pair is prepared in a total spin 0 state. Simultaneously on particle 2 measure

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$a_2(\hat{n}_1,0)$, $a_2(\hat{n}_2',0)$, $a_2(\hat{n}_3',0)$ ——
~~and~~ $\hat{n}_1$, but $\hat{n}_2'$, $\hat{n}_3'$ not necessarily same as $\hat{n}_2$, $\hat{n}_3$ respectively. By MLOC the result of $a_1(\hat{n}_1,0)$ is independent of the choices made for measurement on particle 2, & conversely. But because of total spin 0, the outcome of $a_1(\hat{n}_1,0)$ determines that of $a_2(\hat{n}_2,0)$ and conversely. Hence $a_1(\hat{n}_1,0)$ has a definite value independent of the context determined by $\hat{n}_2$, $\hat{n}_3$. Therefore the local contextualistic hidden variable theory for a pair of spin particles implies a non-contextualistic h.v. theory for a single spin 1 particle — & the latter is algebraically impossible.

Of course, this is just a sketch, & possibly when the sketch is filled out it would be as long as your argument, but I really doubt it.

Incidentally, the theorem of Kochen & Specker is just a corollary of Gleason's theorem, as they say themselves. We

not give a reference to Gleason? Also Bell's Rev. Mod. Phys. paper proves the same corollary with much less complexity than Kochen & Specker.

I too am looking forward to seeing you next October.

With best wishes,

Abner